

APPLICATION UNDER UNITED STATES PATENT LAWS

Invention: **ENCRYPTION UNIT QUICK INSERT/QUICK REMOVAL HOUSING**

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This is a:

- ☐ [] Provisional Application
- ☒ [X] Regular Utility Application
- ☐ [] Continuing Application
- ☐ [] PCT National Phase Application
- ☐ [] Design Application
- ☐ [] Reissue Application
- ☐ [] Plant Application

SPECIFICATION

ENCRYPTION UNIT QUICK INSERT/ QUICK REMOVAL HOUSING

BACKGROUND OF THE INVENTION

1. Field of the Invention

5 This invention relates generally to computer and communication networks, and more specifically, to a mounting method and bracket for the encryption unit portion of a deployable secure communication system used to provide secure voice, video and data services to multiple remote users.

2. Background of Related Art

 Conventional deployable communication systems exist. For instance, Fig. 6 is a depiction of a particular conventional deployable secure communication system.

15 In particular, as shown in Fig. 6, a secure encryption module such as defined by KIV-7 standards **912** with suitable interface hardware is utilized in a direct connection path between a remote user **910** and a wireless connection to a similarly secure receiver via a satellite antenna **914**. In the conventional system of Fig. 6, an ISDN link is utilized between
20 the module **912** including a KIV-7 encryption module, and a suitable satellite two-way communication transceiver and antenna **914**.

 However, such conventional systems are typically physically large. Typical secure, deployable communications systems fill a van or small vehicle. Part of the reason for the significant size of such systems is
25 the need to accommodate racks of communications equipment, including a rack-mounted, standardized encryption unit, e.g., a Type 1 KIV-type encryption device such as a KIV-7, pictured in Fig. 7.

 In particular, Fig. 7 depicts the conventional casing and required connections to a KIV-7 unit.

30 As shown in Fig. 7, a KIV-7 unit **700** includes four separate connector sockets **710-716**. Two of the connectors are 9-pin connectors,

the other two are 37-pin connectors. One of the 9-pin sockets 710, 716 is a male-type connector, and the other 710, 716 is a female-type connector. Similarly, one of the 37-pin connectors 712, 714 is a male-type, while the other 712, 714 is a female-type. The use of male and female-type connectors prevents improper installation cabling to the KIV-7 700.

It should be noted that a KIV-7 has no handles, and is typically rack-mounted into a rack of equipment.

As can be appreciated from the KIV-7 encryption unit depicted in Fig. 7, a significant amount of access must be provided to the rear of the KIV-7 so that the KIV-7 may be replaced if maintenance is required. Such access is typical in most rack-mounted equipment enclosures.

Some conventional deployable secure communications terminals fill a van with equipment. As can be appreciated, in a military environment size is to be minimized so as to expand military options of deployment.

There is a need to reduce the size of a deployable secure communications system.

BRIEF DESCRIPTION OF THE DRAWINGS

Features and advantages of the present invention will become apparent to those skilled in the art from the following description with reference to the drawings, in which:

Fig. 1 shows an exemplary quick insert/quick release encryption unit mounting bracket within a deployable secure communications system, in accordance with the principles of the present invention.

Fig. 2 shows an outside, rear view of an embodiment of the quick insert/quick release encryption unit mounting bracket shown in Fig.

1.

Fig. 3 shows a rear, floating connector plate of the quick insert/quick release encryption unit mounting bracket having 4 connectors mounted thereon to mate with complementary connectors mounted on the rear of the encryption unit, in accordance with the principles of the present invention.

Figs. 4A to 4E show exemplary side, top and bottom components of a first embodiment of a quick insert/quick release encryption unit mounting bracket shown in Fig. 1.

Figs. 5A and 5B show an exemplary separable T-shaped pull to allow quick separation of an installed KIV-7 unit from an encryption unit mounting bracket, in accordance with another aspect of the present invention.

Fig. 6 is a depiction of a particular conventional deployable secure communication system.

Fig. 7 depicts the conventional casing and required connections to a KIV-7 unit.

SUMMARY OF THE INVENTION

In accordance with the principles of the present invention, a quick insert/quick release mounting bracket for an encryption unit comprises a top surface. A right surface is secured to the top surface. A bottom surface is secured to the right surface. A left surface is secured to the top surface. A rear surface having at least four connectors is mounted thereon. The connectors are normally associated with individually secured cables. The rear surface is movably secured in a rear of the mounting bracket so as to allow for a given amount of left/right and up/down tolerance in alignment between the at least four mounted connectors mounted on the rear surface and a matching at least four connectors on a rear of an encryption unit to be slid over the top surface, the bottom surface, the left surface, and the right surface, and into connection with the at least four mounted connectors.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

In a commercial environment where competitors offer portable, secure communication terminals that fill a van or small vehicle, one vendor, TeleCommunication Systems, Inc. (TCS) of Annapolis, Maryland, provides a portable secure communication terminal, and even a deployable secure communications terminal that is uniquely packaged to be small enough to be carried in a suitcase-sized enclosure. Current products from TCS are suitably small enough to be carried by a paratrooper, e.g., into hostile territory. This is significant as prior systems could not be deployed until an aircraft or other transport system carried them directly to the relevant location.

The reduction in size and weight requirements of a deployable, secure communications terminal are due in no small part to the development of a highly compact mounting bracket **100** for the heart of the secure system-the Type 1 KIV-type encryption unit, shown in Fig. 1.

A quick insert/quick release encryption unit mounting bracket **100** in accordance with the principles of the present invention is disclosed for an embodiment based on the KIV-7 **700** (manufactured by Mykotronx) Type 1 encryption device. The disclosed quick insert/quick release mounting bracket **100** allows a Type 1 encryption device such as the KIV-7 **700** to be quickly inserted and perhaps more importantly, quickly removed (e.g., in the event of the need for an extremely quick evacuation of a military site). Importantly, the disclosed quick insert/quick release mounting bracket **100** allows for removal of a Type 1 encryption device **700** such as a KIV-7 without the need to physically unscrew or otherwise disconnect individual cable assemblies.

In accordance with the principles of the present invention, the disclosed quick insert/quick release encryption unit mounting bracket **100** allows a Type 1 encryption device **700** such as a KIV-7 to be inserted by simply sliding the KIV-7 **700** into place, or to be removed by simply

pulling the KIV-7 700 straight out in the direction of the front of the unit. This facilitates a quick swap out of the KIV-7 700 in the event of failure, or in the event that the sensitive nature of the encryption unit 700 needs to be quickly removed to protect the encryption unit 700 from falling into
5 enemy hands.

The KIV-7 700 is typically installed into a multi-bay rack mount shelf assembly that contains a power supply, or in some cases simply placed on a shelf. The design of the KIV-7 700 requires the physical connection of a minimum of three cable assemblies; power input,
10 data input, and data output. The process of inserting the KIV-7 700 into the shelf assembly and connecting the three cable assemblies typically requires several minutes of an individuals time and open access to the rear of shelf for connection and securing of the cable assemblies. Removal of the KIV-7 700 also requires several minutes of time and open
15 access to its rear, typically provided by a rack mount enclosure. Typical rack mount enclosures are 6 feet tall, 2 feet wide, by 3 feet deep.

Through the implementation of the disclosed encryption unit mounting bracket 100, an encryption unit 700 such as a KIV-7 can now be inserted and ready for operation in a matter of just a few seconds.
20 Importantly, the mounting bracket 100 need not provide a routine operator with access to the rear of the encryption unit 700, further facilitating a quick release of the encryption unit 700.

If removal of the bracketed encryption unit 700 becomes required, the encryption unit 700 may be gripped (e.g., by use of the key)
25 and pulled out in just a few seconds without the need for direct access to the rear of the unit.

Conventional installations of a Type 1 encryption unit 700 such as the KIV-7HS or other KIV-type devices (e.g., a KIV-21) required cabling to the rear of the unit 700. The present invention enables the
30 installation and removal of a Type 1 encryption unit 700 without the need

to secure or remove numerous cables connected to the rear of the encryption unit **700**.

Fig. 1 shows an exemplary quick insert/quick release encryption unit mounting bracket within a deployable secure communications system, in accordance with the principles of the present invention.

In particular, Fig. 1 shows an exemplary quick insert/quick release encryption unit housing and mounting bracket **100** placed within a casing **120** intended to contain a deployable, secure communications terminal.

Fig. 2 shows an outside, rear view of the exemplary embodiment of the quick insert/quick release encryption unit mounting bracket shown in Fig. 1.

In particular, Fig. 2 shows a rear plate **202** for fixedly mounting connectors to mate with appropriate connectors on the rear of a Type 1 encryption unit such as the KIV-7. The quick insert/quick release mounting bracket **100** further includes a top **206** (and matching bottom not shown), a left side **204** and a matching right side (not shown).

The top **206**, bottom, left side **204** and right side of the quick insert/quick release mounting bracket **100** preferably include holes or other shaped cut-out areas **210**. The cut-out areas **210** provide a reduction in the weight of the overall secure, deployable communications terminal. Moreover, the cut-out areas **210** also provide for cooling of the KIV-7, which fits snugly inside the quick insert/quick release mounting bracket **100**, with sufficient tolerances to allow easy sliding of the KIV-7 into the quick insert/quick release mounting bracket **100** from its front end **250**.

The bracket may be made of any suitable metal, e.g., aluminum. In such case, individual sides, top and bottom may be made separately from flat stock, and screwed together with appropriate screws **260**. The bracket may also be manufactured from a plastic material, e.g.,

Delron™. Because plastics tend to insulate thermally more than do metals, the use of cut-out areas **210** are more important from a ventilation point of view. The quick insert/quick release mounting bracket **100** may also be formed in a singular piece of metal or plastic. A combination of plastic and metal portions is also possible.

Importantly, the rear plate **202** of the quick insert/quick release mounting bracket **100** is not fixedly mounted to the sides, top or bottom of the quick insert/quick release mounting bracket **100**. Rather, it is captured in appropriate slots in the top, bottom and sides and left floating with some amount of tolerance (e.g., 1/8" in left/right and up/down directions). This 'floatation' allows movement of the connectors mounted to the rear plate **202** with respect to the matching connectors on the rear of the KIV-7 upon insertion of the KIV-7 into the mounting bracket **200**. This 'floatation' is important because of variances in the exact placement of the connectors with respect to the rear of the KIV-7 unit **700**.

Fig. 3 shows the rear, floating connector plate **202** of the quick insert/quick release encryption unit mounting bracket having 4 connectors mounted thereon to mate with complementary connectors mounted on the rear of the encryption unit, in accordance with the principles of the present invention.

In particular, Fig. 3 shows particularly measured placements of the connectors on the rear plate **202**. Of course, these measured placements relate to the exemplary KIV-7 in particular used in the disclosed embodiments. However, the invention is to be understood as relating to KIV-type encryption units in general.

Figs. 4A to 4E show exemplary side, top and bottom components of a first embodiment of a quick insert/quick release encryption unit mounting bracket shown in Fig. 1.

In particular, Figs. 4A to 4C show views of the right side **203** of the quick insert/quick release encryption unit mounting bracket **100**, including the exemplary cut-out areas **210**. Figs 4D and 4E show views of

the top **206**. The bottom in a first embodiment is the same as the top **206**. However, the bottom (or top **206**) surface may be utilized to provide a pull-tab against a KIV-7 unit **700** once inserted into the quick insert/quick release mounting bracket **100**.

5 For instance, Figs. 5A and 5B show an exemplary separable T-shaped pull **516** to allow quick separation of an installed KIV-7 unit **700** from a quick insert/quick release encryption unit mounting bracket **100b**, in accordance with another aspect of the present invention.

10 In particular, Fig. 5A shows a T-shaped pull **516** formed from a portion of the bottom plate **508** of the mounting bracket **100b**. The T-bracket **516** may be formed merely by cutting a bottom plate **506** along cut lines **521-524** to separate the T-shaped pull **516** from the remaining portions **512, 514** of the bottom plate.

15 Importantly, the T-shaped pull **516** includes a lip **532** that extends upwards behind the KIV-7. The rear plate **202** preferably includes a matching cut-out area to accommodate the gripping lip **532**.

20 The T-shaped pull **516** includes finger holes **520** allowing a user to grab hold of the T-shaped pull **516** and pulling it in the 'REMOVE' direction of the arrow shown in Fig. 5A to remove both the T-shaped pull **516** together with the KIV-7 previously inserted into the mounting bracket **100**.

25 The T-shaped pull **516** may be secured when inserted into the mounting bracket **100** merely within the tolerances created between a surface upon which the bottom of the mounting bracket **100** is resting on, and the bottom of the KIV-7 **700**. If desired, the T-shaped pull **516** may include tongue and groove (or other shape) type mating along edges **521, 522** with the remaining surfaces **512, 514** of the bottom plate **508**.

 The disclosed encryption unit mounting bracket **100** allows for use of an encryption unit **700** such as the KIV-7 in areas where space

is extremely limited, such as in a deployable secure communication system.

The disclosed encryption unit mounting bracket **100** does not require securing of any physical connection of any cable assemblies, and thus, requires no hand tools. An individual may insert and remove an encryption unit **700** such as a KIV-7 in just a few seconds, not minutes as in conventional devices utilizing the KIV-7 encryption unit **700**.

Moreover, the sizing of the encryption unit mounting bracket **100**, and the need for operator access only to the front of the encryption unit **700**, the overall size of a product such as a deployable secure communication system can be reduced.

The disclosed quick insert/quick release encryption unit mounting bracket **100** is constructed of any suitable sturdy material, e.g., aluminum or steel, or even a high quality plastic material. The encryption unit mounting bracket **100** comprises five individually manufactured sections (top, bottom, sides and rear), though one or all four of the top, bottom and sides of the mounting bracket **100** may be formed or otherwise manufactured as a single piece. The rear plate is importantly not formed with the top, bottom and sides, to allow adjustment to a wide range in tolerance experienced in mounting of rear connectors on typical KIV-7 units **700**.

Individual side and top sections are assembled with high quality screws and the rear plate **202** is designed to float so as to allow for minor alignment differences in the rear panel connectors of the KIV-7 **700**.

The cable assemblies/connectors are fixed to the rear panel **202** with screws, but importantly the back panel **202** is allowed to freely float in the back end of the mounting bracket **100** to allow for a significantly large variation in physical tolerances in the placement of connectors on the back of the encryption unit **700**.

While the invention has been described with reference to the exemplary embodiments thereof, those skilled in the art will be able to

make various modifications to the described embodiments of the invention without departing from the true spirit and scope of the invention.